

First results of CMS GEM (GE1/1)

Aiwu Zhang, Vallary Bhopatkar,
Jessie Twigger, Marcus Hohlmann
HEPA, Florida Tech
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Outline

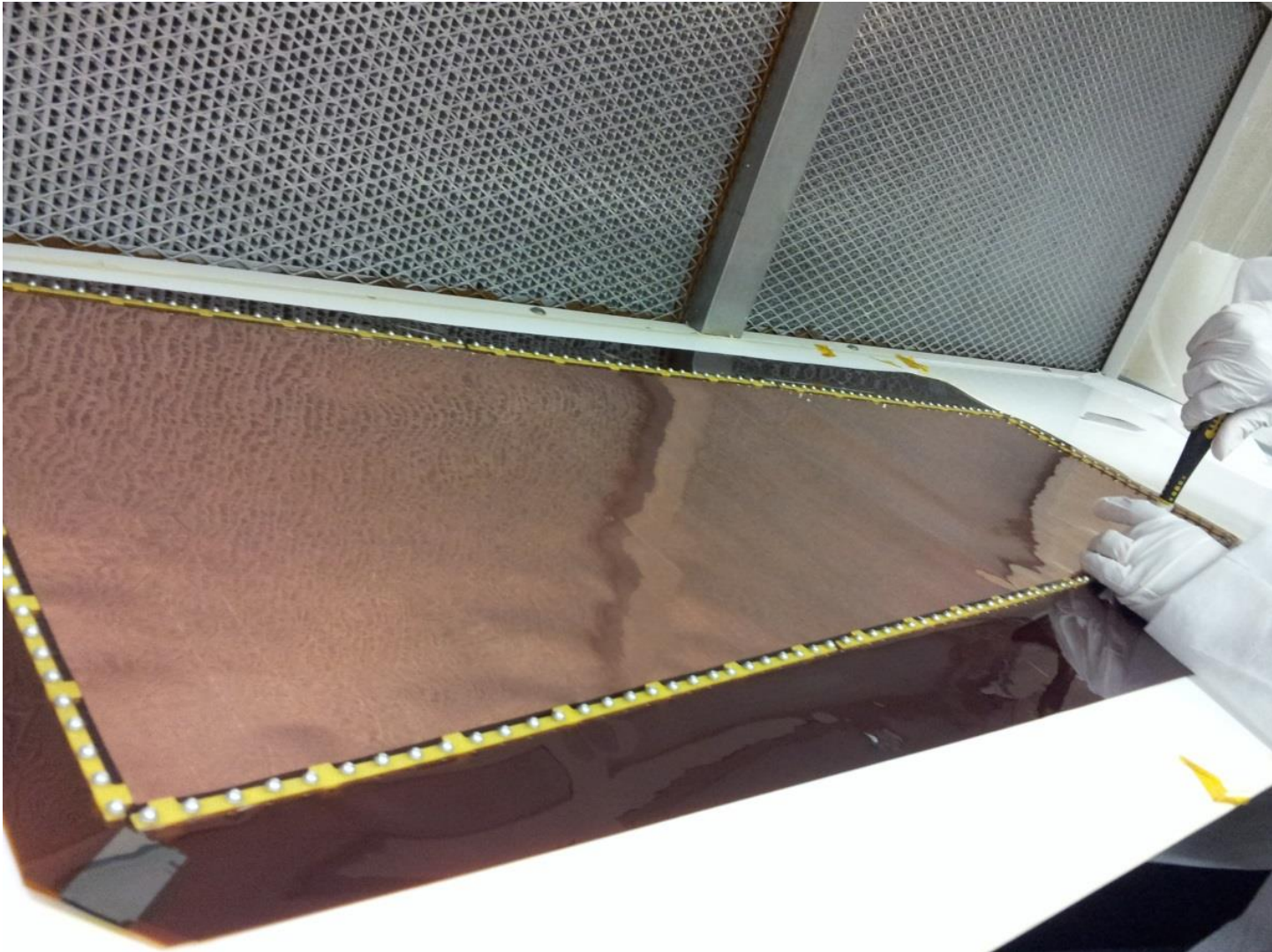
- GEM stack building and detector assembling
- Detector configuration
- Preliminary test
- ✓ Gas flowing and moisture monitoring
- ✓ X-ray source test
- Conclusion

Detector Building

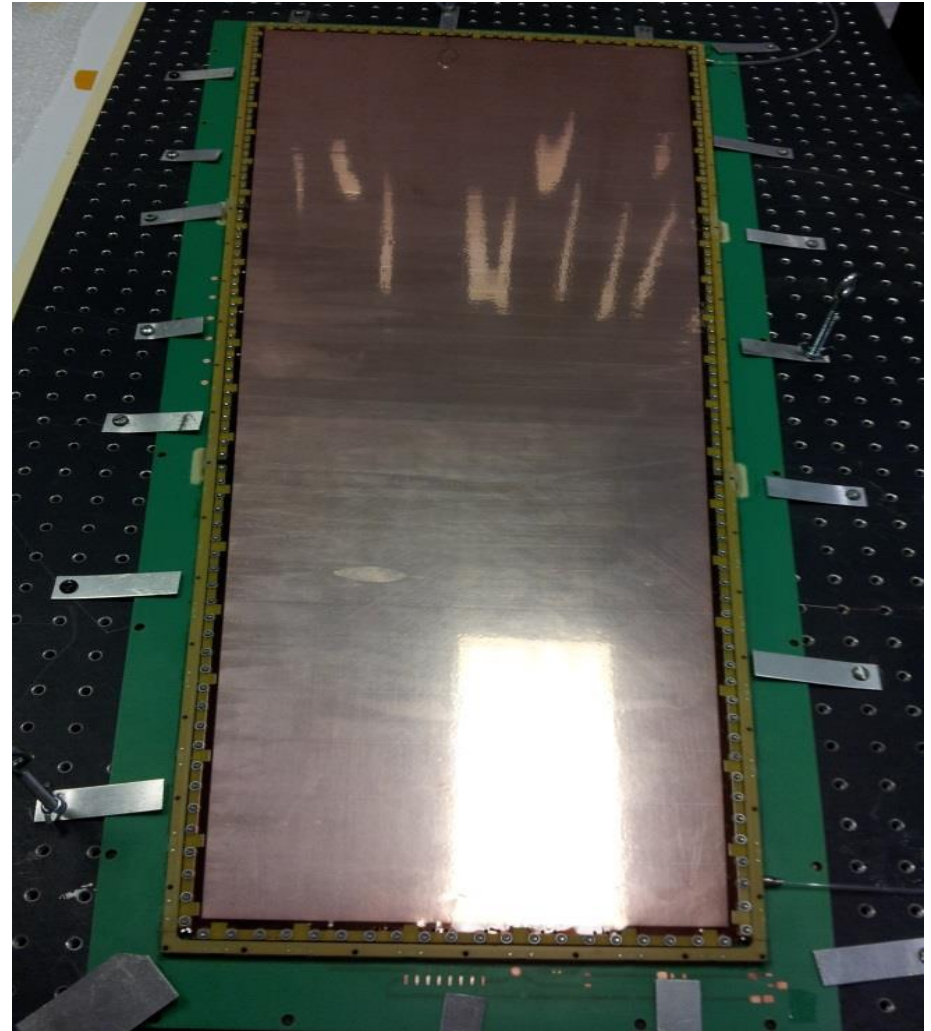
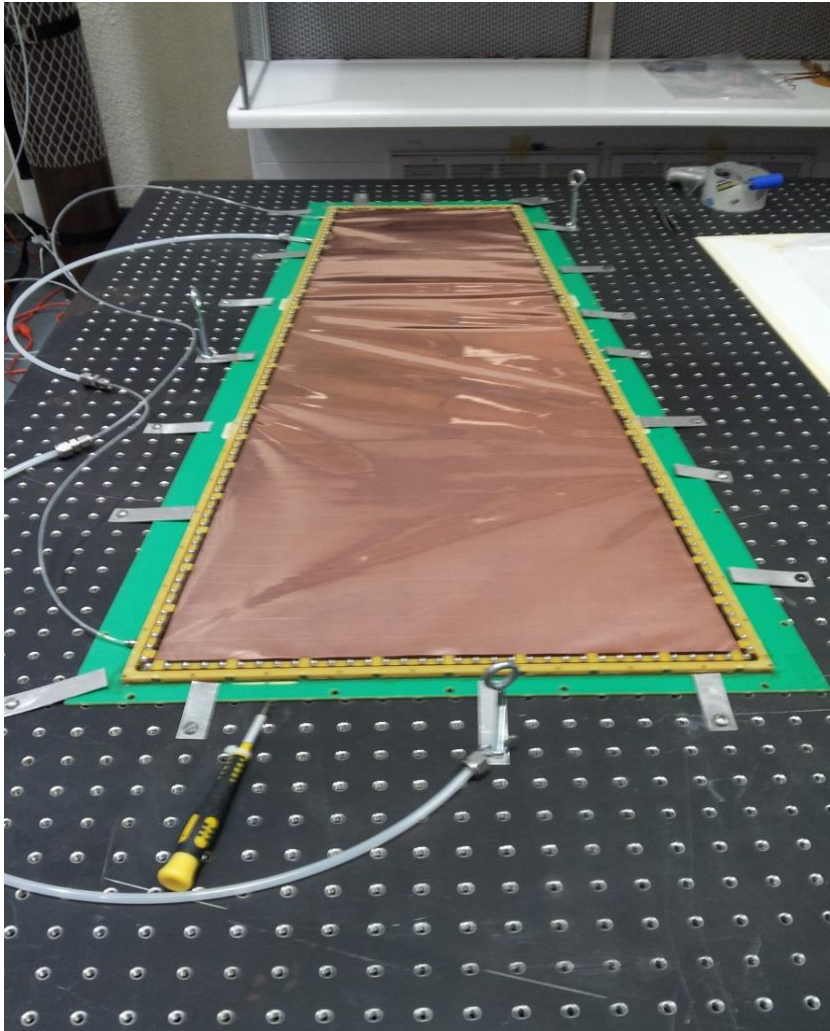
Preparation:

- (1) Leak current of foils were tested to be fine in N₂ gas (less than 5nA@500V).
- (2) All the three foils were test with a Megger before start assembling: resistance > 100GΩ, current < 10nA @ 500V
- (3) Get in mind by what steps will follow during the assembling, and get all stuffs needed ready before start.
- (4) All stuffs need to be cleaned many times!!!

Detector Building

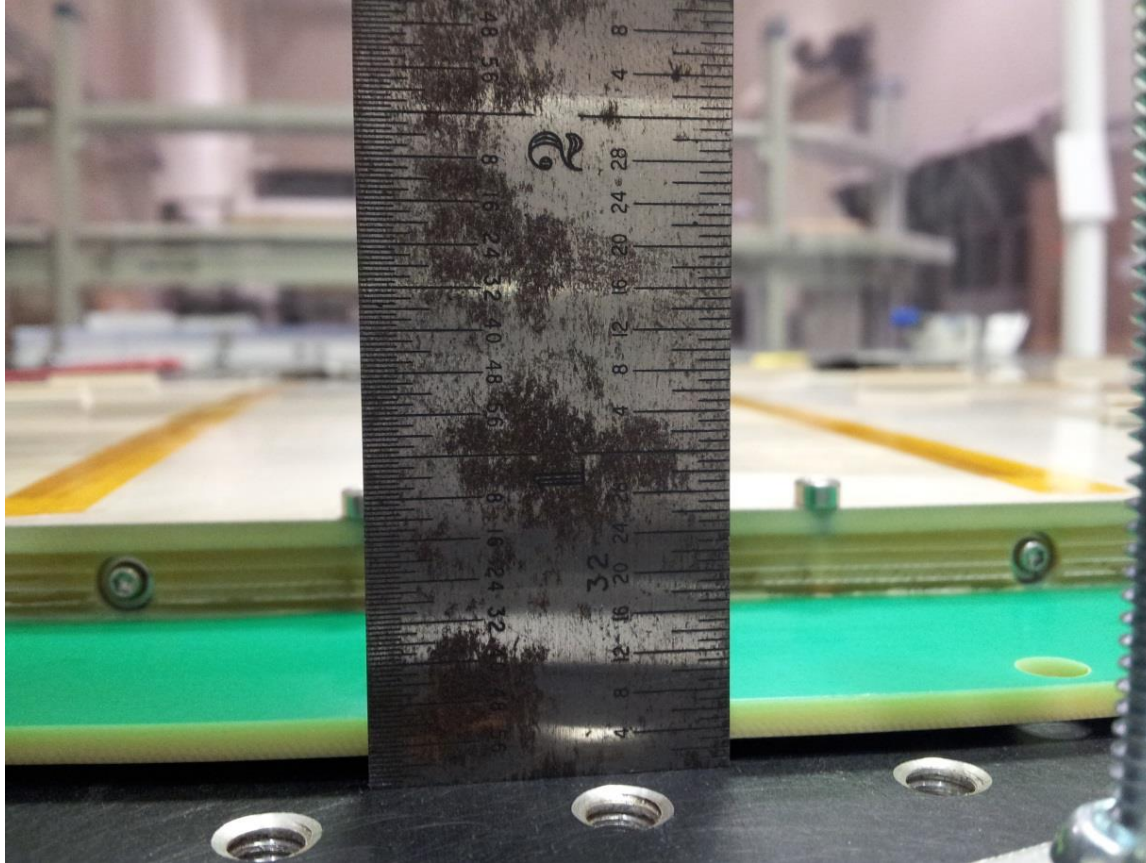


Detector Building



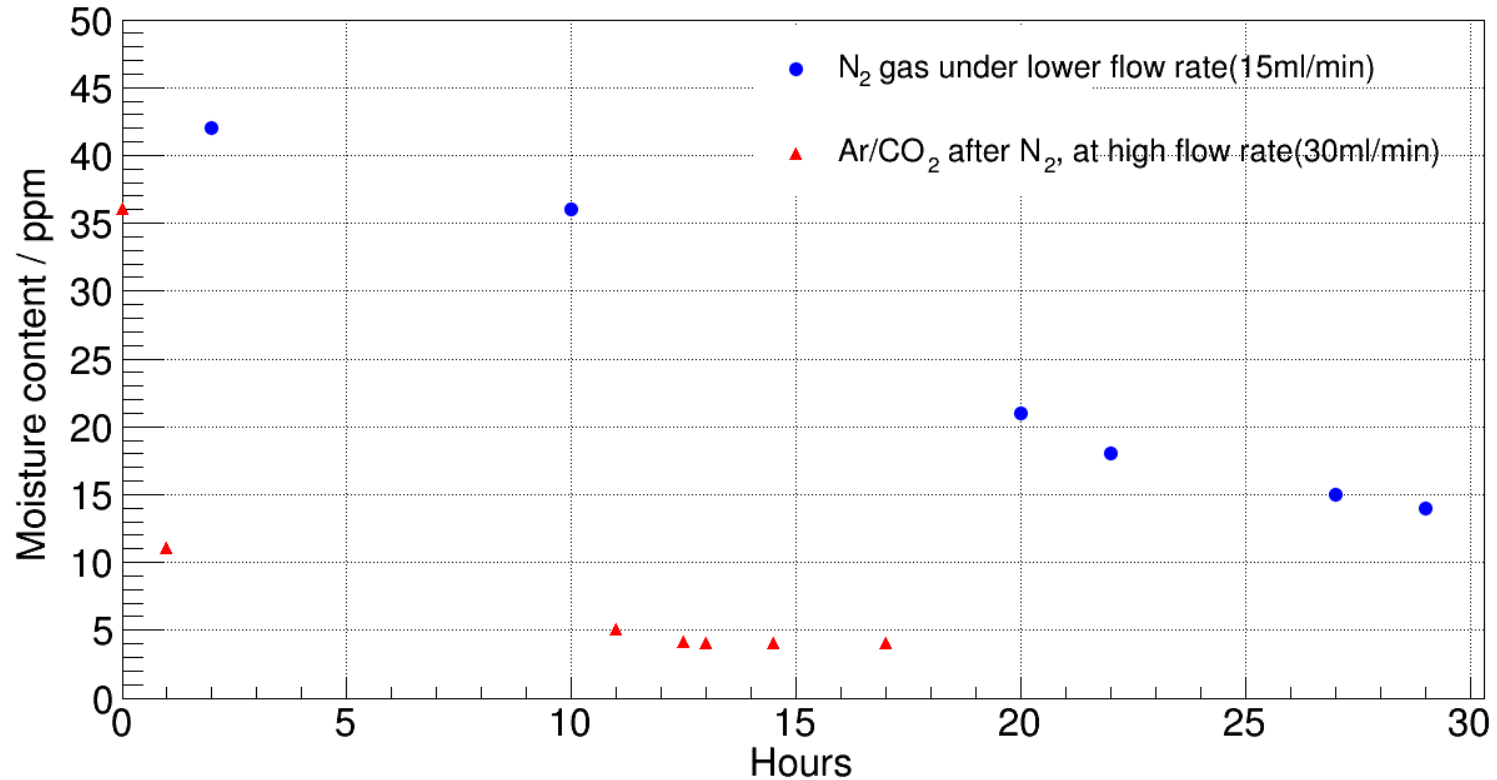
Put the GEM stack into the Drift Frame, which was mounted to optical table to be flat (**important**)! Then stretching the stack.

Detector Building



After closed the detector, release those Al pieces. The drift will bend about 1.6mm, this is acceptable.

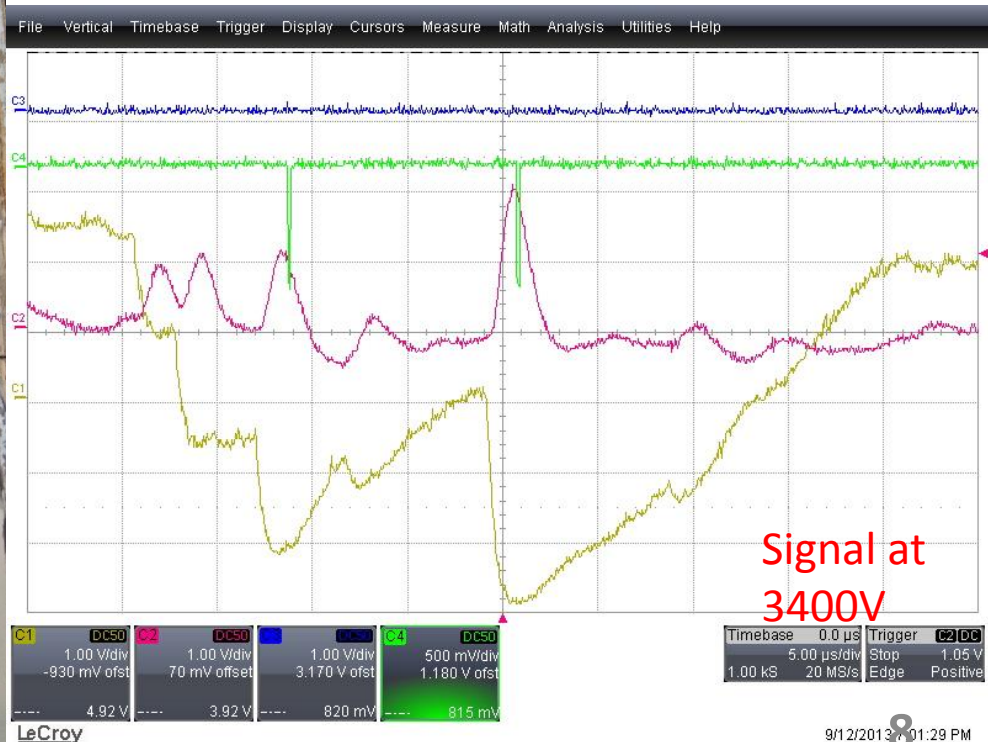
Detector test 1



Moisture content measurement. Generally, it takes more than 24 hours to get a moisture content level of 5ppm, that's enough for testing.

Detector test 1

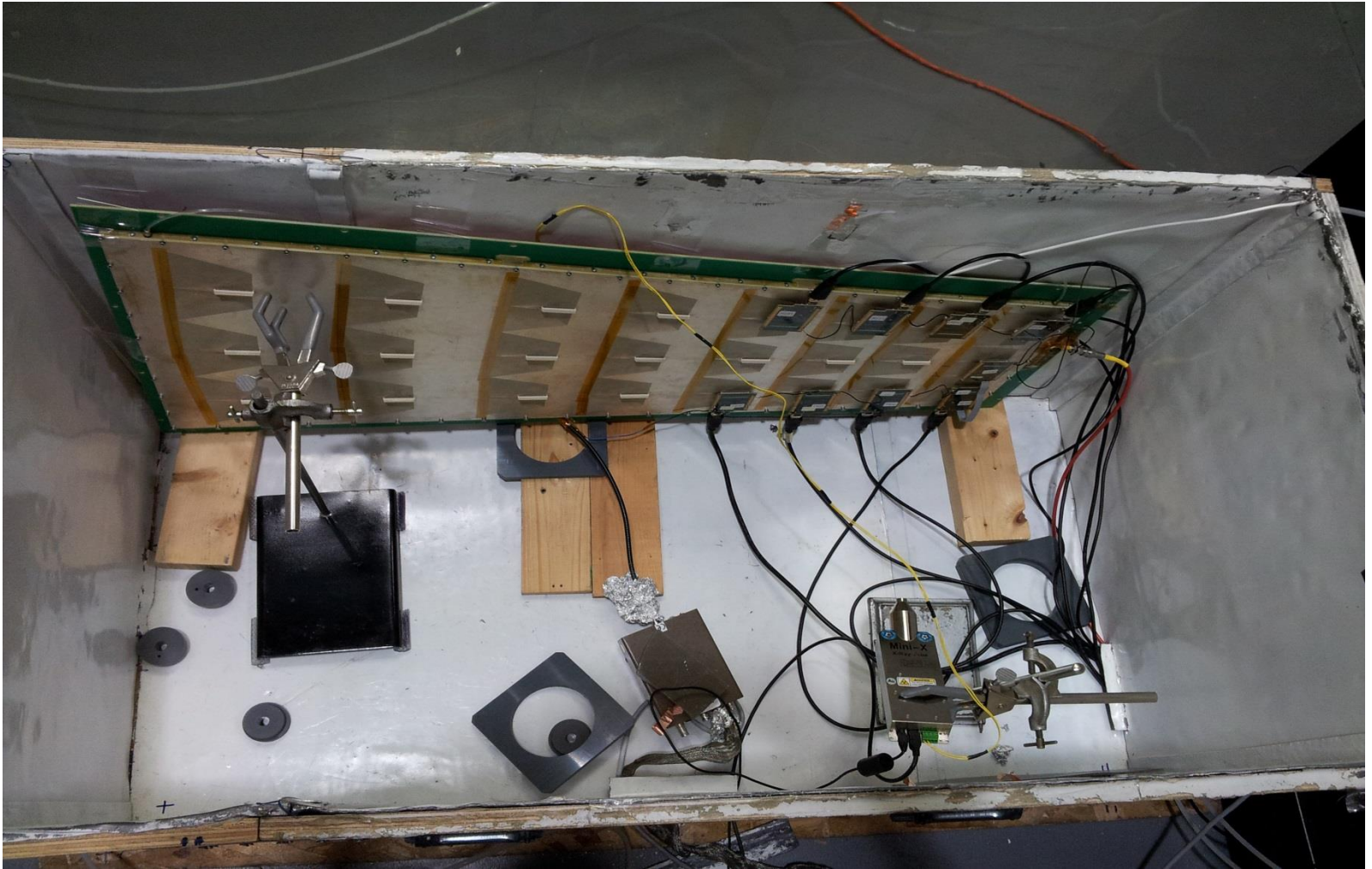
- Chamber was laid flat, and trigger signal from bottom of 3rd foil.
- The detector was observed working from 3200V to 3500V!



9/16/2013

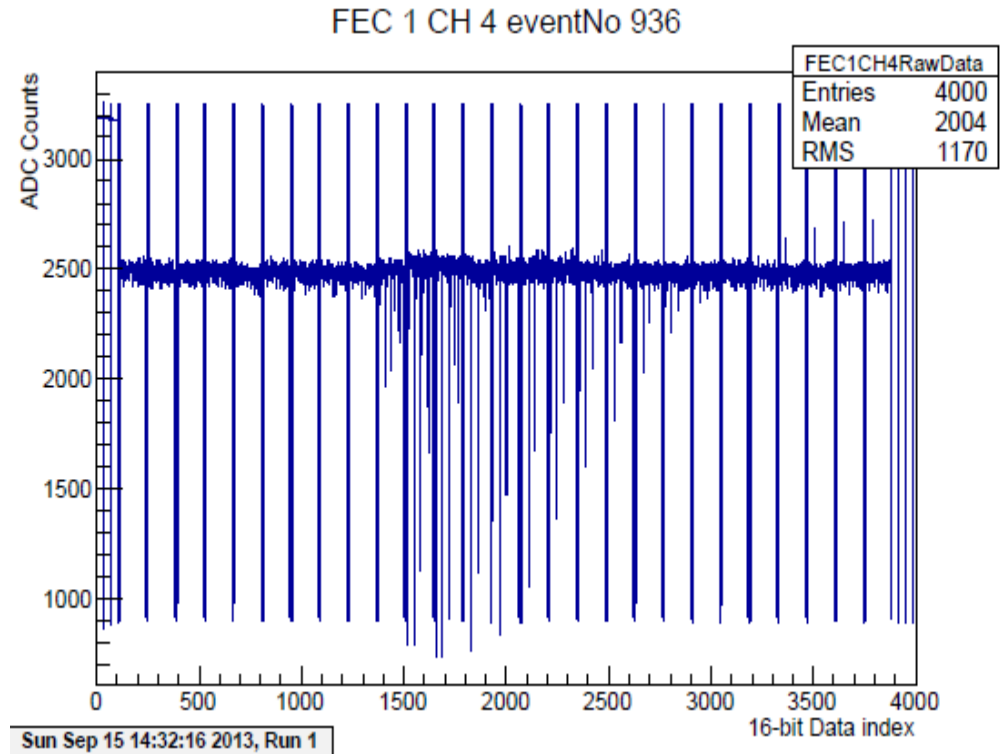
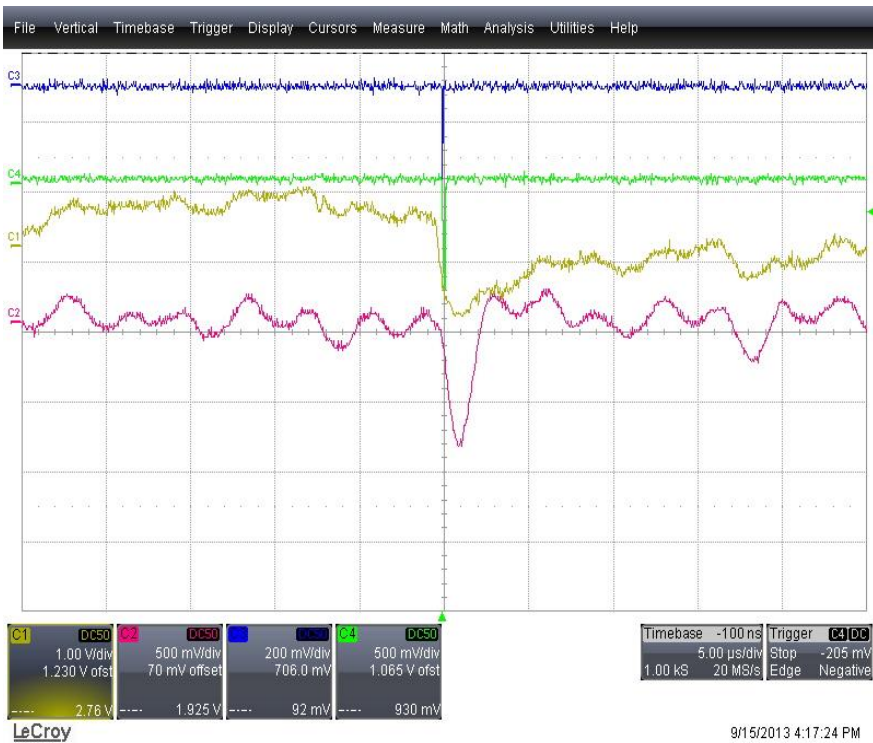
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Detector test 2



Detector was placed **vertically**,
only 9 APVs were used (8 Masters, 1 Slave)

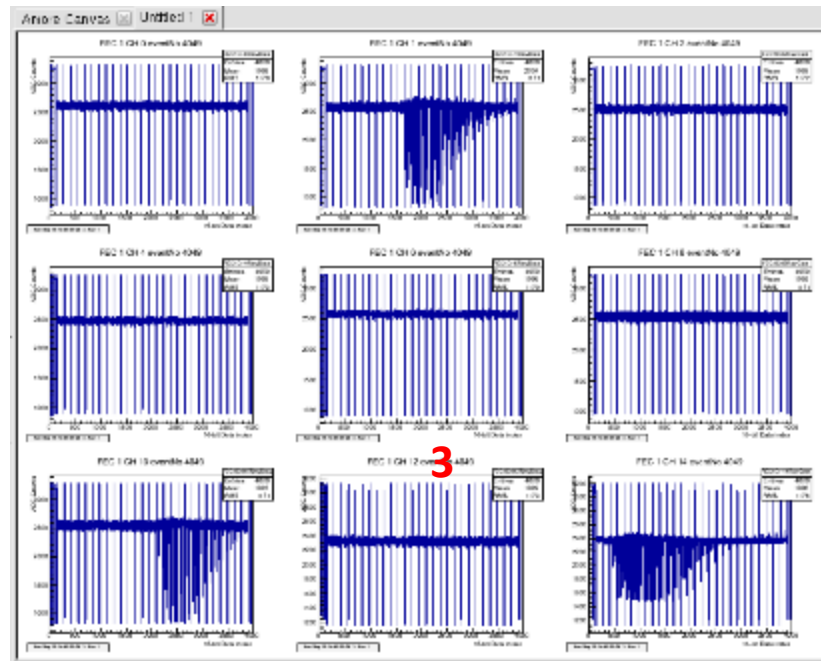
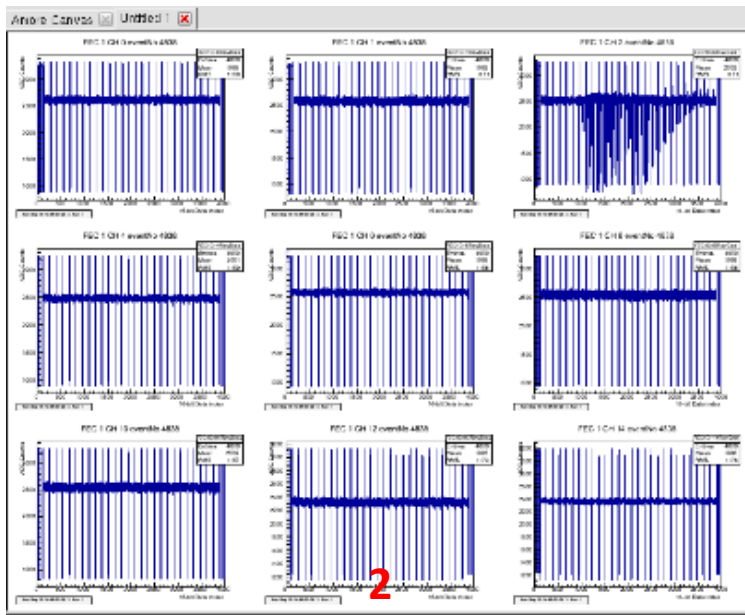
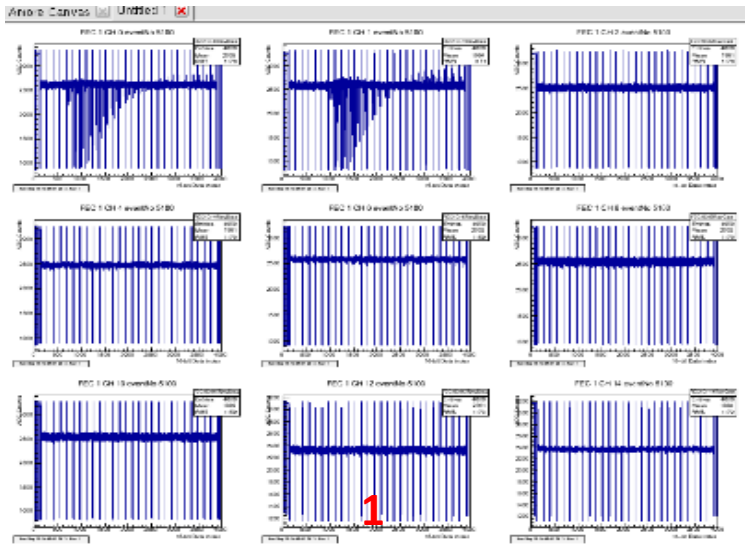
Detector test 2



Signal at 3350V, X-ray: 30kV, 5 μ A

Signals could be recorded nicely with SRS.

Detector test 2



Some double events,
and very few triple events could
be seen.

Conclusion

- The CMS GEM detector is working properly!
Have collected much data with SRS.
- The mapping file is still on the way, so that we can analyze the data.
- The zigzag r/o board for CMS GEM was scheduled to arrive on Wednesday, hopefully we will get the zigzag CMS GEM detector ready just before we leave for FNAL.

Thanks!!